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ASSESSING THE EFFECTIVENESS OF E – LEARNING EDUCATION MATERIAL ON NUTRITION AND HEALTH ATTITUDE OF RURAL WOMEN: A QUASI EXPERIMENTAL STUDY

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ABSTRACT

The use of Information and Communication Technology (ICT) is considered to be a necessity, to overcome the challenges hindering the country from developing and in reducing the digital divide. Hence, the present study is to assess the effectiveness of the 2 D animated films, on the nutritional and health attitudes of rural women. Educating women through e – learning (EWE), a 2 D animated film was made in English and local language (Telugu), which included educational content on nutritional needs of children (0-6 years), pregnant, lactating women, common nutritional deficiencies seen among these groups, strategies to control and prevent them. It was a quasi experimental pre test – post test research design. A total sample of 130 rural women, belonging to the reproductive age group, 15 – 49 years were selected from three villages, one of which served as an experimental group (n=100) and the other acted as the control group (n=30). A standardized questionnaire developed for the study was used to assess attitude at pre and post-intervention. There was an increase in the mean attitude score from 52.87 to 70.64, after the intervention. The gain in attitude score was 17.8, for the experimental group which was highly significant (P<0.01)

KEYWORDS: E-Learning, Rural Women, 2d Animated Film & Nutritional Attitude

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Original Article

INTRODUCTION

India is poised to emerge as one of the most developed nations by 2020 being more literate, knowledgeable and at the forefront economically. Women empowerment is crucial to the economic growth of any country. Rural women are key actors, in solving the major issues on the development agenda for the coming century, including the need to manage the environment in a sustainable manner, control the exploding rate of population and urbanization, food security, human needs with regard to health, education and literacy and in the elimination of poverty.

For the development of the rural environment, education should be taken up on a priority basis, since it is the basis for creativity and foresightedness that triggers change; it helps in economic growth, quality of life and the quality of human resource.

Information technology has a profound effect on education. Digital learning is faster and better than the traditional learning, since it integrates multimedia, instructor - led and real - time learning techniques in a facilitated, collaborative learning environment.

Based on the study by Brug*et al.* (1996), nutritional education using computers is more effective than traditional nutritional education, as the digital nutritional education package is more readable and memorable, than the traditional educational materials, including booklets and pamphlets.

Multimedia helps in creating messages that enhance learning, giving direct information without bias, promoting medical decision support and expert advice with tailoring the information to age, sex, language, literacy level, ethnic background, socio - economic status, medical history and helps consumers ask better questions and get involved in their nutrition treatment plans.

Nutrition education is defined as any set of learning experiences, designed to facilitate voluntary adoption of eating and other nutrition related behavior, conducive to health and well-being (Contento, 1995).

Nutrition education is essential for promoting knowledge of nutrition, as well as nutritional practices, which have the potential to result in the better nutritional status of the targeted population (Nnakive, 2009). It can improve the knowledge and also bring about a change in their behavior.

It has been recommended that, effective nutrition interventions should have a behavioral focus, that will minimize the targeted risk factors, utilize theoretical framework, consist of changes to the environment, provide adequate dose and include strategies, that are developmentally and culturally appropriate. However, to achieve the desired behavioral changes related to health and nutrition, it will require the attainment of adequate knowledge, attitudes, skills and self-efficacy (Contento *et al.*, 2002, Wardle *et al*., 2000 and Vereecken *et al*., 2005).

Nutrition and Health, Attitude

Attitude, refers to the inclinations to react in a certain way to certain situations, to see and interpret events according to certain predispositions or to organize opinions into coherent and interrelated structures. According to Hogg and Vaughan (2005), an attitude is defined as a relatively enduring organization of beliefs, feelings and behavioral tendencies towards socially significant objects, groups, events or symbols.

Albarracin *et al.* (2005) mentioned that, attitude is a mental or neural state of readiness organized through experience, exerting a directive or dynamic influence upon the individual's response, to all objects and situations with which it is related.

Attitude towards healthy eating were explored by Hearty *et al. (*2007). According to dietary intake, lifestyle and socio – demographic correlates in Irish adults, it was seen that females, increasing age, higher social class, tertiary education, non – smokers, lower body weight and increased recreational activities were associated with a negative attitude towards healthy eating behavior.

The results from the study of mother's nutritional knowledge and attitude on children's dietary intake, by Shookri *et al.* (2011) support the inclusion of knowledge and attitudes, in dietary interventions. It was shown that, a lower dietary adequacy of children's food intake was seen in mothers with low educational levels, high - ranked occupation and lower levels of both nutritional knowledge and food related health attitudes. The highest food intake and healthy eating attitude scores were found in children of mothers, with high education level and mother without a job. Thus, the association of the dietary adequacy with socio - demographic background can help the Omani healthcare decision makers, to develop better tailored nutrition interventions, which are more suitable for the Omani community.

Smriti *et al.* (2010), carried out a community based health and nutrition education intervention, focusing on several factors influencing child health with special emphasis on diarrhea in an urban slum. Results showed that, health and nutrition - education intervention improved the knowledge and attitudes of mothers, towards the usage of ORS packets and the sugar salt solution.

Concerning occupation, the results revealed that, Omani mothers' work had an inverse effect on their nutritional knowledge and healthy eating attitudes (Shookri *et al.* 2011).

Although, age and education level of the participants were significant predictors of the attitude level in univariate analyses, after adjusting for confounding factors in multiple regressions, only education level and the interaction term of sex and age remained significant predictors in multivariate analyses. Study participants, who had completed higher secondary education, were found to have higher odds of good attitude, compared to illiterates. Furthermore, females of older age group had significantly higher attitude scores than males (Dhimal *et al*. 2014).

Szucs *et al.* (2015) explored Hungarian consumer's attitude towards a healthy diet and identified three different consumer groups. One of which was, the ambitious cluster, which showed positive attitude, the other was a "health conscious" cluster, which actively supported a healthy diet and the members of the "indifferent" cluster were the least interested in healthy diets.

Athletes lack nutritional knowledge, but have a positive attitude towards nutrition, which was observed by Marquitta *et al.* (2014) in a study on nutritional knowledge and attitudes of adolescent swimmers, wherein it was seen that, nutritional knowledge was positively and significantly related to the attitudes.

E - Learning technologies have great potential to spread learning. However, the benefits of these technologies have to reach the rural masses of India, otherwise they will be one of the causes of the Digital Divide., "a gap between those able to benefit from digital technology and those who cannot" (Smyth, 2006) widening for residents in these rural areas.

If e - learning reaches the remote and rural parts of India, it would be much faster to educate people. Hence, the present study is planned to develop e – nutrition education material and assess its effectiveness on the nutritional attitude of the rural masses, keeping in mind the following objective.

General Objective

The main objective of the study, was to assess the effectiveness of the developed e – nutrition education material, on the nutritional attitudes of rural women.

MATERIALS AND METHODS

In the present study, quasi experimental design has been used for pre – post testing, with a control group which is useful in assessing the effectiveness of the material, developed on the attitudes of the rural women before and after the educational intervention.

Research design:

Design of the Experiment: Assessment of KAP before and after intervention

Number of Villages: 3

Number of Treatments: 1

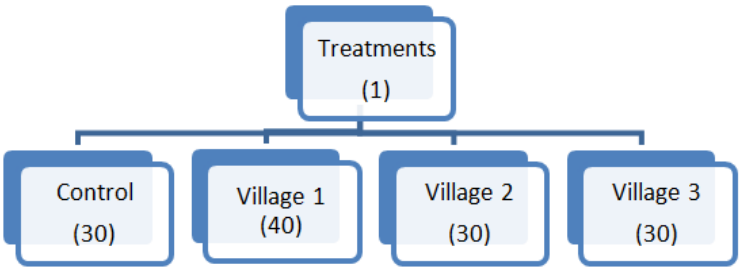

Figure 1: Categorization of Respondents in Three Different Villages in the Experimental Group and Control Group

As shown in figure 1, a total sample of 130 rural women belonging to the reproductive age group of (15-49) years was selected from three villages namely Pudur, Gangupaly and Mirzapur of Pudurmandal, Rangareddy district, Telangana. The control group constituted of 30 women, 10 from each village and the rest of 100 rural women were divided among the three villages which comprised the experimental group.

Table 1: Distribution of Respondents According to their Profile Characteristics in Experimental Group and Control Group

Sr. No	Variable	Category	Experimental Group N=100		Control Group N=30	
	Age		**F**	**%**	**F**	**%**
1	Young women	15-25 years	40	40	9	30
	Middle aged women	26-35 years	44	44	14	47
	Old women	36-49 years	16	16	7	23
2	Marital status	Married	82	82	26	87
		Unmarried	18	18	4	13
3	Education	Illiterate	15	15	0	0
		primary school	14	14	26	86
		middle school	8	8	2	7
		high school	48	48	0	0
		College	15	15	2	7
4	Occupation	house wife	81	81	23	76
		working women	8	8	5	17
		Student	11	11	2	7
5	Family type	Nuclear	55	55	18	60
		Joint	45	45	12	40
6	Income -poor	upto 2000	2	2	2	7
	-low	2000-5000	39	39	5	17
	-medium	5000-10000	40	40	23	76
	-high	> 10000	19	19	0	0
7	Possession of Audio-visual material	Television	51	51	18	60
		Mobile	36	36	12	40
		CD Player/Laptop	13	13	0	0
8	Mass media exposure	Never	2	2	2	7
		occasional	2	2	28	93
		daily	96	96	0	0
9.	Urban contact	Medium	77	77	30	100
		High	23	23	0	0

The data were collected at the beginning of the study, in both the experimental group and the control group. A standardized knowledge questionnaire on aspects of nutrition, health and hygiene was developed, for the present research. After the collection of the relevant data, an E - nutrition education material, "educating women through e – learning'' a digital nutrition education package called 'EWE', a short educational film of 15 minutes duration was prepared for the rural women, with a well-defined concept and properly formulated dialogues, which included basic information on nutrition, health and hygiene. The major focus in developing e – nutrition education material, was to cover aspects like nutritional needs of children (0- 6 years), pregnant and lactating women, maintaining proper hygiene and sanitation, diarrhea, immunization, malaria and de-worming, as the most common nutritional deficiencies seen in these vulnerable groups of rural population and strategies, to prevent and control these deficiencies.

The educational intervention was shown to the experimental group, only for a period of 6 months. After the intervention, final data were collected in both the groups. The attitude questionnaire, which composed of 24 questions was given to both the experimental and control groups, after a period of six months to assess the effectiveness of the animated film, on the attitude of rural women.

RESULTS

The present study showed that, the e – learning education intervention, conducted over a period of 6 months had a positive impact on attitude on nutrition and health, among rural women.

Table 2: Distribution of KAP Scores in Experimental Group and Control Group before Educational Intervention

	Experimental Group (N=100)		Control Group (N=30)	
Scores	**Pre – Test n %**		**Pre – Test n %**	
Attitude				
45 – 52	34	34	16	53.33
52 – 59	64	64	14	46.67
59 – 66	0	0	0	0.00
66 – 73	2	2	0	0.00

Table 3: Distribution of KAP Scores in Experimental Group and Control Group after Educational Intervention

	Experimental Group (N=100)		Control Group (N=30)	
Scores	**Post – Test n %**		**Post – Test n %**	
Attitude				
45 – 52	0	0	15	50.00
52 – 59	0	0	14	46.67
59 – 66	1	1	1	3.33
66 – 73	99	99	0	0.00

Table 4: Distribution of Attitude Scores in Experimental and Control Group before and after Educational Intervention

Scores	Experimental Group (N=100)				Control Group (N=30)			
	Pre-Test		Post Test		Pre-Test		Post-Test	
	N	%	N	%	N	%	N	%
Attitude								
45 – 52	34	34	0	0	16	53.33	15	50.00
52 – 59	64	64	0	0	14	46.67	14	46.67
59 – 66	0	0	1	1	0	0.00	1	3.33
66 – 73	2	2	99	99	0	0.00	0	0.00

Table 5: Gain in Attitude Scores of Respondents after Exposure to the 2D Animated Film among Rural Women

SI. No	Category	Mean Attitude Score		'T' value	Gain in Attitude	Quantum of Improvement
		Before Exposure	After Exposure			
1	Experimental group	52.87±0.38	70.64±0.17	42.24**	17.8	1.34
2	Control group	51.50±0.52	51.8±0.59	0.38^{ns}	0.3	1.01

** - Significant at 1%,* - Significant at 5%; ns - Non significant at 5%

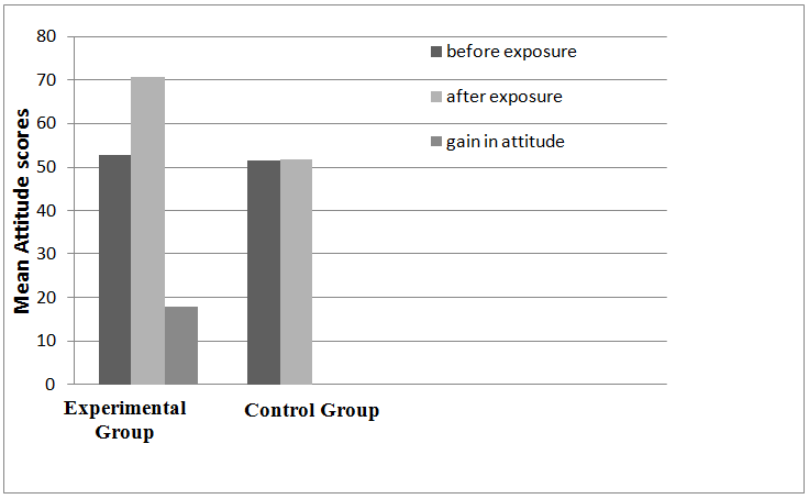

Figure 2: Mean Attitude Scores and Gain in Attitude of Respondents in Experimental and Control Group before and after Exposure to the 2 D Animated Film

DISCUSSIONS

The distribution of KAP scores of the subjects is presented in Table 2. It was found that, 64 percent subjects obtained 52 - 59 scores and 34 percent scored 45 – 52 and 2 percent scored between 66 – 73, in the experimental group before intervention.

The corresponding values in the control group were 53.33 percent subjects scored 45 – 52 and 46.67 percent subjects scored 52 – 59, before the intervention.

As shown in the table 3, the overall percentage score of correct answers for attitude was 71.44 percent, and after the educational intervention the percentage of correct answers by the sample for attitude was 95.45 percent. Thus, it can be concluded that, there was a good amount of increase in attitude through the e - learning intervention programme, with

regard to nutrition, health and hygiene.

Rajbir *et al.* (2008) showed that, the urban elderly had higher scores than the rural elderly, in a study to evaluate the impact of nutrition counseling, as they were more literate and exposed to media like newspaper, radio and television.

Fey *et al.* (2002) also reported that, knowledge scores improved in the subjects, as a result of reading the monthly nutrition newsletter.

The attitude scores, according to the table 3 was found that, in the experimental group 99 percent (2 per cent in pre – intervention) subjects scored 66 – 73 and only 1 percent scored 59 – 66. Furthermore, the number of subjects who scored 45 – 59 decreased to 0, at post intervention. The corresponding values in the control group, showed no significant changes even after 6 months, as no intervention was given to them.

Results presented in Table 5, indicate that, before exposure to the animated film, mean attitude scores of the experimental group were 52.87 and that for the control group was 51.5. The mean attitude scores after exposure was 70.64, in the experimental group and for the control group it was 51.8. The gain in attitude score was 17.8 for the experimental group, which was highly significant ($P<0.01$) and 0.3 for the control group and the same is shown in figure 2.

Hence, the high post intervention scores suggested that, education was effective in improving the attitude levels, as the focus was in line with the existing beliefs and needs of the community.

CONCLUSIONS

Thus, it can be concluded that, the intervention package had the potential to increase the nutrition, health and attitude of rural women and motivate them to adopt a healthy lifestyle, thus reducing morbidity risk and the cost incurred for health care. It was also suggested that, the 2D animated film was a useful and an engaging, powerful tool to increase the attention span of the subjects. It can serve as a model for developing future health related documents. However, health related staff must be trained to use and implement the package, to ensure its sustainability in improving health outcomes of older adults in the community. It would also be interesting to implement the package into a web-based application, so that, more users can access and benefit from it. A technological system is considered successful, when most consumers are interested in using the technology that helps them to believe that, these systems are easy to use and beneficial.

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